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(21) International Application Number: PCT/GB98/02710 (22) International Filing Date: 9 September 1998 (09.09.98) (30) Priority Data: 9718980.7 9 September 1997 (09.09.97) GB (71)(72) Applicant and Inventor: HOJIN, Naofumi [JP/GB]; 6 Barrow Elm Barns, Netherton, Near Quenington, Gloucester GL7 5DE (GB). (74) Agent: ALLSOP, John, Rowland; MacLeod Allsop, Bledington Grounds, Bledington, Gloucestershire OX7 6XL (GB).		(81) Designated States: AU, CA, JP, KR, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: AN INDICATION DEVICE FOR VEHICLE OPERATING CONDITIONS (57) Abstract <p>This invention relates to vehicles and in particular to the means provided in vehicles which presently are limited to providing the driver with a visual indication of vehicle operating conditions such as engine revolutions and selected gear positions. The need for visual determination of an operating condition as is presently the case, requires the driver to divert attention from the road ahead. This, as well as being a safety hazard, can be a distinct driving disadvantage. Thus in situations such as Formula (I) racing, even a split second movement of the driver's eyes from the road could be critical from the point of view of winning the race. The invention deals with these problems by providing touch-tell indicators easily accessible by the driver's fingers when operating a floor mounted gear shift or a modern type of button arrangement provided on the steering wheel, which provide the driver with all the information necessary as to gear selection and/or engine revolutions without the need to visually ascertain these parameters from instrument dials.</p>		

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AN INDICATION DEVICE FOR VEHICLE OPERATING CONDITIONS

FIELD OF THE INVENTION

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This invention relates to vehicles and particularly to the means provided in vehicles which give a visual indication to the driver of vehicle operating conditions such as engine revolutions and selected gear positions.

10

BACKGROUND OF THE INVENTION

In the case of engine revolutions such visual indication is by means of a tachometer or revolution counter provided on the instrument panel of the vehicle. In the case of selected gear position this has to be ascertained by glancing at the gear shift; in some cases such as in an automatic gear transmission system, gear selection is also displayed on the instrument panel.

Gear selection when driving, and engine revolutions generated in that gear selection, are important not only from the point of view of engine stress but also in terms of the economy of fuel consumption which has become a predominant concern in recent times.

In this connection some vehicles are equipped with "economy indicators" which again are only visually accessible on the instrument panel of the vehicle.

25

A visual determination of these parameters naturally acts to draw the attention of the driver from what he should mainly be doing, that is observing road conditions and taking appropriate action as a result of those observed conditions.

In the use of a standard automatic transmission system in a vehicle, the driver has occasion to select gear ranges other than provided by the normal drive position. This would occur for example on hills and while negotiating corners.

5

A fairly recent innovation in automatic transmission systems and now adopted widely in Formula I racing cars, is the provision of a gear shift in the form of a pair of spaced buttons on the steering wheel of the vehicle.

10 One of the buttons is used to shift to higher gears, the other to lower gears, than the one actually in use, all movements selecting individual gears which are held by the system and only change at the driver's choosing.

In effect this system equates to the conventional manual system but without the need to
15 actuate a clutch or move a gear lever.

Thus whereas in an ordinary automatic transmission system which has ranges which the driver is able to select, that is for example the drive or D range so that the transmission automatically selects the gears available say 1st to 5th gear and other selectable gear
20 ranges, the new system selects individual gears in the gear range which are held until the driver wishes to change gear of his own volition.

Porsche Motor Cars have recently introduced the Tytronic® system which incorporates a conventional automatic transmission gear shift and an extra facility which enables the driver
25 to select individual gears.

The extra facility is provided in two forms, one of them is the same as that used in Formula I cars as described above, the other incorporates a selector gate separate but situated next to the conventional system into which the gear selector lever is movable. In the gate

position the selector lever is pushed forward to go upwardly through the gears and pulled backwards to shift to lower gears.

As alluded to earlier if a driver wishes to know which gear or gear range he is in while using these various systems, or to have knowledge of engine revolutions, he has to observe indicators for example on an instrument panel. This is particularly important in a racing car because knowledge of the gear position and engine revolutions is essential, for example when negotiating corners or ascending inclines which presently requires the driver to move his or her attention away from the road.

10

OBJECT OF THE INVENTION

It is an object of the invention to provide indication means for determining engine operating parameters such as energy revolutions and gear selection whereby the information needed to determine these parameters is by feel rather than by visual observation.

15

Thus the present invention envisages that information about gear selection and/or the number of engine revolutions determined by that gear selection are ascertained by touch and feel so that the driver does not have to divert his attention from the primary purpose of controlling the vehicle under specific driving conditions.

20

Thus information concerning vehicle operating parameters in accordance with the invention may be determined by the hand rather than the eye.

25

SUMMARY OF THE INVENTION

According to the invention there is provided an indicating device for a vehicle comprising indication means providing touch-tell information of a vehicle operating parameter such as engine revolutions and gear selection, and means for relaying information representative of said operating parameter to the indication means to activate the same such that the driver is informed, as by feel, of said operating parameter.

Advantageously the indication means is provided on the gear shift of the vehicle and is preferably in the form of depressible buttons on the handle of a floor mounted gear shift, the depressed position of each button being indicative of a particular vehicle operating parameter.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become apparent from the following description of the preferred embodiments taken with reference to the accompanying drawings wherein:

20

Fig. 1 shows two forms of gear shift in present use modified in accordance with the invention;

Fig. 2 is a part plan view of a steering wheel incorporating position indicators in accordance with the invention;

Fig. 3 shows the two forms of gear shift of Fig. 1 further modified in accordance with the invention;

Fig. 4 shows the same view as Fig. 2 further modified in accordance with the invention;

Fig. 5 is a side view of the head of a gear shift provided with an alternative form of indication means in accordance with the invention, and

Fig. 6 is a side view of a modified form of the indicating means shown in Fig. 5.

PREFERRED EMBODIMENTS OF THE INVENTION

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In Fig. 1 the head 2 of a gear shift 1 for an automatic transmission having a range of five gears, is provided with four depressible buttons B1, B2, B3 and B4 which can be engaged respectively by the four fingers of the hand.

- 10 The buttons B1 through B4 may be activated through the on board computer system of the vehicle (not described herein) which may be adapted to provide signals to operate the buttons in response to gear changes in the automatic transmission.

- 15 In the D range which is the position selected when the driver wishes the car to operate automatically through the gears, the buttons B are in an on position, that is they are physically up.

- If the driver selects for example the four gear range then button B4 is automatically depressed and the driver can feel this when handling the head 2. When a different gear range is selected, for example the three gear range, the buttons B4 and B3 are automatically depressed and so on.
- 20

- The same concept can be applied in the Tytronic® system as described earlier in this disclosure.

25

In the form of this system employing a gate adjacent a conventional gear lever selector, the depressible buttons will be provided on the lever itself as with the Fig. 1 embodiment and activatable both for the conventional position of the gear lever where gear range selection is possible and for individual gear selection with the gear lever selector in the gate position.

In the other form of the Typtronic® system as illustrated in Fig. 2, depressible buttons B are attached to the curve of the steering wheel W adjacent the higher and lower gear selection buttons 5, 6 provided on a spoke S of the steering wheel W, so as to be in easy reach of the driver's fingers when the shift is being used.

With this arrangement when operating the buttons 5, 6 the driver does not have to resort to any visual indication on an instrument panel as to any present gear position, rather he uses his fingers to determine operating conditions by finger searching the buttons B.

10

In Fig. 3 and 4 a further illustration is given of an arrangement of touch-tell movable buttons or switches for a five-gear automatic transmission system.

This arrangement, when compared to Figs 1 and 2, has an additional larger leverage button or pad D5 positioned so as to be length-wise of the straight line array of buttons numbered 1, 2, 3 and 4.

15

When the driver is in 4th gear only button pad D5 is activated to a depressed position while the rest of the buttons or switches 1 through 4 are in their up or rest position.

20

When the transmission is in 3rd gear the buttons or switches D5 and 4 are activated to their depressed positions and so on. In this case of course switches or buttons D5, 4, 3, 2 and 1 indicate a range of gear selection.

Thus when the driver starts the car, and chooses the first gear to move off or the system chooses the first gear automatically, all the remotely actuatable touch-tell switches or buttons, with the exception of button 1, are in the up position.

25

When the car engages second gear the switches or buttons 2 and 1 are in the up position while the rest of the switches are depressed.

5 When the fifth gear is reached all the switches or buttons D5, 4, 3, 2 and 1 are in their rest positions.

The above touch-tell concept of providing information to a driver as to gear selection may also be used to provide the driver with knowledge of engine revolutions without the need for visual observation of a revolution counter on the instrument panel.

10

In Fig. 5 the head 7 of a gear shift is provided with a single button 8 which is set to activate when the engine has reached a stress condition, which is presently indicated by a red zone on standard revolution counters.

15 In Fig. 6 two depressible buttons 9, 10 are shown, the upper one 9 of which will be set to activate when the engine revolutions reach stress conditions and the lower button 10 to tell the driver that the vehicle is not being driven in a manner commensurate with the best fuel economy.

20 As will have been apparent from the foregoing it is evident that the invention provides means whereby the driver of a car is able to determine gear selection, engine revolutions and the like, through physical contact rather than through the provision of visual information. Thus the driver's attention is not distracted by the need to take his eyes off the road to determine a particular gear engaged which as well as diminishing the joy of sporty
25 driving for example is also a safety hazard.

The proposed system in accordance with the invention, is also an aid to fuel economy because it can relay information to the driver concerning gear selection and fuel usage in a more positive and compelling manner than heretofore possible.

The above is only one preferred form of the invention and other ways may readily be devised for its realisation by those skilled in the art. The invention is thus not limited for example to depressible buttons for relaying the required information about gear selection.

- 5 For example vibrating buttons could be used or other such coded indicating means which may be sensed by touch could be employed to achieve the required result all within the scope of the invention as defined in the appended claims.

- Moreover the invention is equally applicable to manually operated gear transmissions as
10 will be readily appreciated. In this connection, as with an automatic transmission system, and in relation to touch-tell determination of gear or gear range selection, actual movements of the gear shift be it floor mounted or positioned on the steering wheel, could be used by simple mechanical means to activate in the required sequence, the touch-tell buttons, all positioned within easy reach of the driver's fingers, in the embodiments
15 described.

- In relation to touch-tell determination of engine revolutions, the necessary signals to activate the buttons may be obtained from the on-board computer system of the vehicle although other methods to obtain those signals from the vehicle engine would be readily
20 apparent to those skilled in the art. For example alarm buzzers presently exist to tell the driver when maximum engine revolutions have been reached and the same circuitry could be employed to activate the touch-tell buttons instead of the alarm.

CLAIMS

- 1 An indicating device for a vehicle comprising indication means providing touch-tell
information of a vehicle operating parameter such as engine revolutions and gear
5 selection, and means for relaying information representative of said operating
parameter to the indication means to activate the same such that the driver is
informed, as by feel, of said operating parameter.
- 2 An indicating device as claimed in claim 1 wherein the indication means is provided
10 on a floor mounted gear shift of the vehicle.
- 3 An indicating device as claimed in claim 1 wherein the indication means is on the
steering wheel of the vehicle.
- 15 4 An indicating device as claimed in claim 1 wherein in the case of the vehicle being
provided with a finger operable gear shift on the steering wheel, the indication
means is positioned adjacent said finger operable gear shift for finger searching by
the vehicle driver.
- 20 5 An indicating device as claimed in any preceding claim wherein the touch-tell
indication means is in the form of finger searchable actuatable buttons, which actuate
in a particular coded sequence in response to signals provided by an on-board
computer system of the vehicle and representative of said operating parameter.
- 25 6 An indicating device as claimed in claim 5 wherein a particular gear or gear range
engaged is indicated by a depressed position of the buttons, the greater number of
buttons depressed the lower the gear or the fewer the number of gears in the gear
range selected, respectively.

- 7 An indicating device as claimed in claim 5 wherein there is a single depressible button on the gear shift or steering wheel respectively, said button being actuated to a depressed position when engine revolutions exceed a permitted number commensurate with allowable engine stress and/or economic fuel consumption.

5

- 8 An indicating device as claimed in claim 7 wherein there is a further depressible button on the gear shift or steering wheel respectively, said additional button moving to a depressed position when consumption of fuel exceeds a maximum predetermined value commensurate with economic fuel consumption.

10

- 9 An indicating device for a vehicle substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

1/2

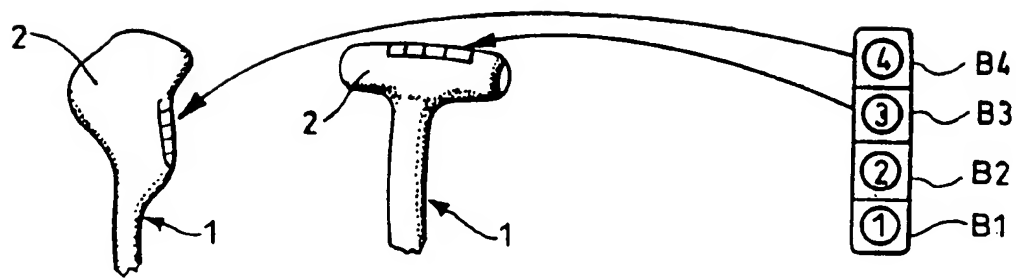


FIG.1.

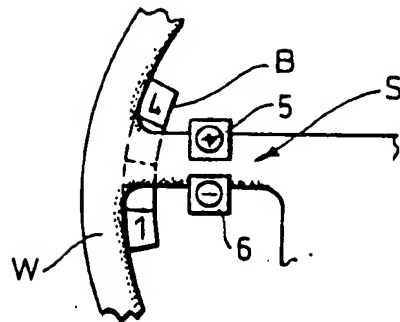
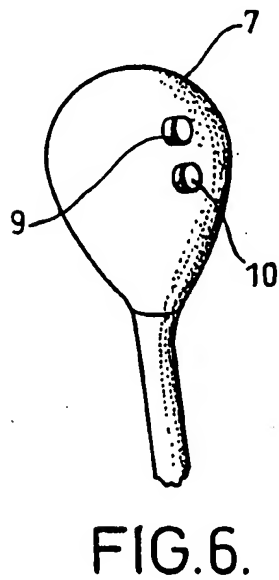
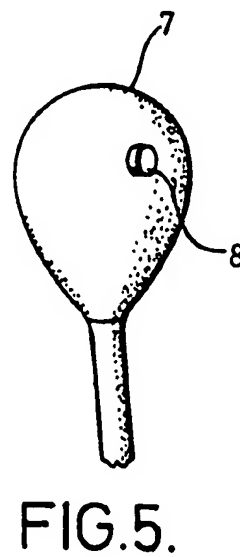
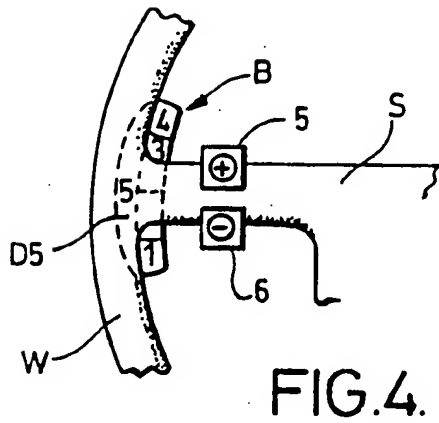
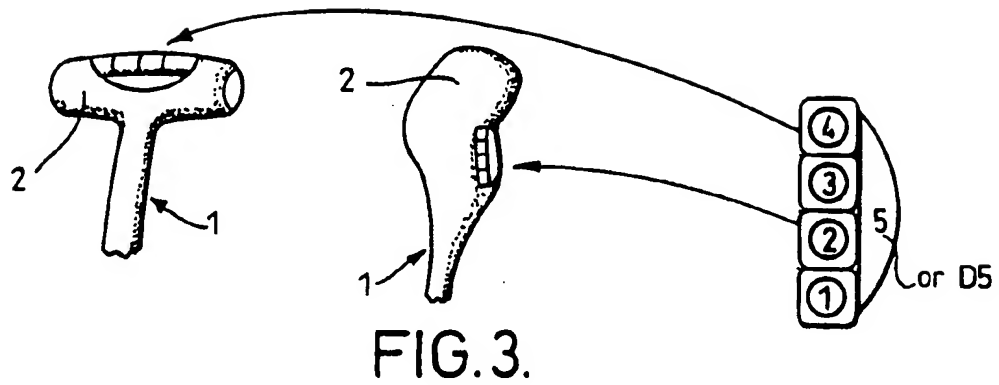


FIG.2.

2/2



INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 98/02710

A. CLASSIFICATION OF SUBJECT MATTER F 16 H 59/12, G 05 G 5/03, B 60 K 20/02 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) B 60 K, F 16 H, G 05 G Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Patent Abstracts of Japan, Vol. 13, No. 454 (P-944), 13 October 1989; & JP, A, 01-177114 (SUZUKI), 13 July 1989.	1, 2
A	--	3-9
A	DE 19510179 A1 (MEYERLE) 28 September 1995 (28.09.95), fig. 6a-6c.	1-9
X	Patent Abstracts of Japan, Vol. 96, No. 8, 30 August 1996; & JP, A, 08-091079 (KUBOTA) 09 April 1996.	1, 2
A	--	3-9
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Date of the actual completion of the international search 30 November 1998		Date of mailing of the international search report 04.02.1999
Name and mailing address of the ISA/ European Patent Office Facsimile No.		Authorized officer WERDECKER e.h. Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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ANHANG

zum internationalen Recherchen-
bericht über die internationale
Patentanmeldung Nr.

ANNEX

to the International Search
Report to the International Patent
Application No.

ANNEXE

au rapport de recherche inter-
national relatif à la demande de brevet
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PCT/GB 98/02710 SAE 208263

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